

### Claims

1. A compression refrigeration system including at least a compressor (1), a heat rejector (2), an expansion means (3) and a heat absorber (4) connected in a closed circulation circuit that may operate with supercritical high-side pressure **characterized** in that the system heat pump efficiency can be improved by controlling the compressor suction gas superheat and that carbon dioxide or a refrigerant mixture containing carbon dioxide is applied as the refrigerant in the system.
2. System according to claim 1, **characterized** in that the superheat will be increased when the temperature of the heat source is above a predetermined level.
3. System according to any of the preceding claims 1-2, **characterised** in that a limitation for the superheat will be compressor discharge temperature, which can not exceed a predetermined level.
4. System according to any of the preceding claims 1-3, **characterized** in that a split stream from the heat rejector 2 is used for compressor suction gas superheating.
5. System according to any of the preceding claims 1-4, **characterized** in that the split stream from the high pressure side is expanded directly down to heat absorber pressure after suction gas heating.
6. System according to any of the preceding claims 1-5, **characterized** in that the split stream flow may be regulated in order to control suction gas superheat

7. System according to any of the preceding claims 1-6, **characterized** in that a counterflow heat exchanger is used to heat the compressor suction gas.
8. System according to any of the preceding claims 1-7, **characterized** in that the counterflow heat exchanger may be a separate unit or the internal heat exchanger if already installed.